

## Cholesterol and Your Health

Cholesterol is a natural substance that serves as a building block for cells and hormones. A certain amount is good for you. But, excess cholesterol can stick to the walls of vessels, making it harder for blood to move through them. Sometimes cholesterol blocks an artery. Then, the body part served by the artery cannot receive needed nutrients or oxygen. A heart attack can occur if an artery is blocked in the heart. If the blockage is in the brain, a stroke can result.

This pamphlet will explain:

- How cholesterol works in the body
- Who should be tested
- What you can do to lower your cholesterol level

Heart disease affects many women. You should be aware of the role that cholesterol plays in your health.

### How Cholesterol Works in the Body

#### *Where It Comes From*

Most of the cholesterol in your body is made by the liver. A small amount also comes from certain foods, such as meat, dairy products (such as butter, whole milk, and cheese), and eggs. The amount of cholesterol in your body depends partly on your diet and partly on factors passed on from your parents (heredity).

#### *What It Does*

The fat in the foods you eat is digested and sent to the liver. The liver then changes the fat into *lipoproteins*. Lipoproteins are made of cholesterol, other fats, and protein. Lipoproteins carry fat through your blood vessels for use or storage in other parts of the body. Without them, fat could not travel through the bloodstream. This is because blood is mainly made of water—and fat and water do not mix.

There are three kinds of lipoproteins:

- VLDL (very-low-density lipoprotein)
- LDL (low-density lipoprotein)
- HDL (high-density lipoprotein)

Each lipoprotein has a job to do. First, the liver changes the fat into VLDL, which carries the fat through your blood vessels to your fat tissue. After the VLDL drops off some of the fat, but not its cholesterol, it becomes LDL. It is LDL, sometimes called "bad cholesterol," that can stick to the sides of blood vessels and even block arteries in vital organs such as the heart and brain.

HDL, sometimes called "good cholesterol," keeps cholesterol from building up in artery walls. It does this by picking it up and taking it back to the liver. Then, the liver breaks it down so that it can be passed out of the body. A high level of HDL helps to lower the level of LDL. The goal of a healthy diet is to keep HDL high and LDL low.

### What Happens When You Eat Too Much Fat?

A high-fat diet causes too much LDL, or bad cholesterol, in the bloodstream. This can make it hard for the HDL, or good cholesterol, to do its job.

Too much cholesterol can clog blood vessels. This causes deposits that form a substance called plaque. Over the years, the plaque narrows and hardens the arteries. This is called *atherosclerosis*.

High blood cholesterol has no symptoms. A simple blood test can show whether your level is normal. Knowing how to keep a healthy cholesterol level through diet, exercise, and regular checkups will help you to lower your risk of *cardiovascular disease*.

### Testing for Cholesterol Levels

The amount of total cholesterol in your blood can be found by a simple blood test. Total cholesterol is the sum of LDL and HDL. In general, the lower your cholesterol level, the better.

A lipoprotein analysis may be done if the test shows that your cholesterol level is more than 200 mg/dL. This test breaks down the total cholesterol into LDL and HDL. Your level of VLDL may be tested, too. Even if your cholesterol level is less than 200 mg/dL, you may need a lipoprotein analysis if you have one of the following risk factors:

- History of parent, brother, or sister with a cholesterol level of 240 mg/dL or higher
- History of brother, sister, parent, or grandparent with heart disease before age 55

### Cholesterol and Triglyceride Levels\*

Level (mg/dL)	Category
<b>HDL (Good) Cholesterol</b>	
Less than 40	Low
<b>60 or above</b>	<b>High</b>
<b>LDL (Bad) cholesterol</b>	
<b>Less than 100</b>	<b>Optimal</b>
100–129	Near optimal/above optimal
130–159	Borderline High
160–189	High
190 or above	Very high
<b>Total cholesterol</b>	
<b>Less than 200</b>	<b>Desirable</b>
200–239	Borderline high
240 or above	High
<b>Triglycerides</b>	
<b>Less than 150</b>	<b>Normal</b>
150–199	Borderline high
200–499	High
500 or above	Very high

\*Recommended levels are shown in bold type.

Data from Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Summary of the third report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA 2001;285:2486–2497.

- Diabetes
- Cigarette smoking

You also may have your triglycerides tested. They are a type of fat. Recommended levels of cholesterol and triglycerides are shown in the table.

LDL cholesterol is key. When it's too high, your risk of heart attack, stroke, or other cardiovascular disease is increased.

All women aged 45 years and older should have their cholesterol levels checked every 5 years. Women with any of the following risk factors may need to be tested more often and at a younger age:

- Have had high cholesterol or heart disease
- Have a family history of high cholesterol or heart disease
- Smoke
- Have diabetes

### **Risk Factors for Atherosclerosis**

The amounts of total and LDL cholesterol in the blood are the best ways to predict whether a person will develop atherosclerosis. Other risk factors, though, also have an effect:

- Age 55 or older in women
- Heart attack or sudden death before age 55 in father or brother or before age 65 in mother or sister
- Cigarette smoking
- High blood pressure
- Levels of HDL below 35 mg/dL
- Diabetes
- Lifestyle that is not active
- Obesity

As the number of these risk factors increases, so does the risk of cardiovascular disease. Your doctor can make up a treatment plan to help you control some of these risk factors.

If you are very overweight or do not exercise enough, you add to your risk. Changes in your lifestyle can help you control some of these risk factors. The sooner you make changes, the better the chance you have to stay healthy.

Certain risk factors may be more key in women than in men. These include diabetes, high levels of triglycerides, and very low levels of HDL. If you have one of these risk factors as well as high cholesterol, your doctor may suggest you receive special care.

## How High Cholesterol Affects Women

The leading causes of death in women are heart attack and stroke. In fact, cardiovascular disease causes twice as many deaths in women as cancer. The same number of women and men die from heart attacks, but women die at an older age.

The female hormone *estrogen* tends to protect a woman from the effects of too much cholesterol. But after menopause, the level of estrogen decreases. Then, a woman's risk of cardiovascular disease begins to increase. By age 65, women have nearly the same amount of heart disease as men.

Some women who have reached menopause have used *hormone therapy (HT)* to protect against heart disease. Today, HT is no longer recommended for this protection. Talk with your doctor about HT and menopause. He or she can advise you about the benefits and risks for you.

## Lowering Your Cholesterol

You can lower your cholesterol level by eating foods low in fat (especially low in saturated fat) and cholesterol and by losing weight. Exercise helps, too. It raises the level of good (HDL) cholesterol in your blood, helps you lose weight, and lowers your blood pressure. The good news is that there is a two-for-one benefit: your risk of heart disease goes down by 2% for each 1% that your cholesterol level goes down.

## Change Your Diet

Making changes in your diet can help lower your cholesterol level. You should eat more fiber (oats, beans, and fruit) and starches (grains and root vegetables like carrots, turnips, and potatoes). Eat foods that are low in cholesterol.

Nutrition Facts	
Serving Size 1 Package (46.8g)	
Servings Per container 1	
Amount Per Serving	
<b>Calories</b> 180	Calories from Fat 18
% Daily Value	
<b>Total Fat</b> 2g	<b>3%</b>
Saturated Fat 0g	<b>0%</b>
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 1100mg	<b>46%</b>
<b>Total Carbohydrate</b> 36g	<b>12%</b>
Dietary Fiber less than 1g	<b>1%</b>
Sugars 2g	
<b>Protein</b> 5g	
Vitamin A 0%	Vitamin C 0%
Calcium 0%	Iron 3%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calorie 2,000 2,500
Total Fat	Less than 65g 80g
Sat. Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9	Carbohydrate 4 Protein 4

## Read the Label

Read labels on all the foods you buy. The label will tell you how many grams of fat and how many calories are in each serving.

Fats should make up less than 30% of the total calories in your daily diet. Based on a 2,000 calorie a day diet, this is about 60 grams of fat each day. If you eat fewer than 2,000 calories a day, you should eat fewer than 65 grams of fat.

Each gram of fat has 9 calories. To find the total calories from fat, multiply the number of grams of fat in a serving shown on the

label by 9. For instance, 1 ounce of potato chips has 10 grams of fat. This means that 90 of its calories come from fat ( $10 \times 9 = 90$ ). If the potato chips have a total of 150 calories, 60% of the calories come from fat (divide 90 by 150 = .60 or 60%). If more than 30% of the calories are from fat, that food is high in fat.

An ounce of pretzels has 110 calories and 1 gram of fat. This means that 9 calories ( $1 \times 9$ ) come from fat. Those calories are only 8% of the total (9 divided by 110).

## A Low-Fat Diet

For a balanced diet that is low in fat and cholesterol, choose from each of the food groups each day. Use few fats, oils, and sweets. Check the following lists for examples of foods to select and avoid.

<b>Food Group</b>	<b>Choose More Often</b>	<b>Choose Less Often</b>
Fruits	Citrus fruits (oranges, grapefruit); apples, berries, pears	Coconut
Vegetables	Dark-green, leafy vegetables (spinach, collard, endive); yellow-orange vegetables (carrots, sweet potatoes, squash); cabbage, broccoli, cauliflower, Brussels sprouts	Vegetables prepared in butter, oil, cheese, or cream sauces
Bread, Cereal, Rice, and Pasta	Whole-wheat, rye, oatmeal, and pumpernickel breads; whole-grain and bran cereals; rice; pasta	Refined-flour breads and cakes; biscuits, croissants; crackers, chips; cookies, pastries; granola
Milk, Yogurt, and Cheese	Low-fat or skim milk; low-fat or nonfat yogurt and cheeses (ricotta, farmer, cottage, mozzarella); sherbet; frozen low-fat yogurt; ice milk	Whole milk; butter; yogurt made from whole milk; sweet cream, sour cream, whipped cream, and other creamy toppings (including imitation); ice cream; coffee creamers (including nondairy); cream cheese, cheese spreads, Brie, Camembert, hard cheeses (Swiss, cheddar)
Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts	Low-fat chicken or turkey without skin; fresh or frozen fish; water-packed canned tuna; lean meat trimmed of all fat; cooked dry beans and peas; egg whites	Beef, veal, lamb, and pork cuts with marbling, untrimmed of fat; duck, goose; organ meats, such as liver; luncheon meats, sausage, hot dogs; shellfish*; peanut butter, nuts, seeds; trail mix; tuna packed in oil; egg yolks, whole eggs

\*Although shellfish are low in fat, they have at least as much cholesterol as meats and poultry.

You also should eat foods low in saturated fat because this fat affects how cholesterol breaks down in the body. Saturated fat is solid at room temperature. It includes animal fats (butter and lard) and some vegetable fats (coconut, palm, and those listed on labels as "partially hydrogenated" oils).

Monounsaturated fats (olive, peanut, and canola oils) and polyunsaturated fats (safflower, sunflower, and corn oils) are better choices than saturated fats. Monounsaturated fats do not raise your cholesterol as much as saturated fats.

The best choice, though, is to limit all fats. Fat should make up less than 30% of the total calories in your diet. Based on a 2,000-calorie diet, this is about 65 grams of fat a day (see box). Women who eat fewer calories should eat fewer grams of fat. See the table for suggestions for a low-fat diet.

Low-fat cooking methods help, too:

- Broil, steam, braise, bake, or poach foods.
- Skim or cut all fat from food.
- Cut back on butter, margarine, heavy sauces, mayonnaise, rich desserts and baked goods, and fried foods.
- When you eat meat, choose lean cuts.
- Choose fish or poultry without skin.
- Eat low-fat dairy products.

### *Exercise*

Aerobic exercise (such as walking, jogging, or swimming) raises your HDL (good cholesterol) level. It is best to exercise regularly, at least three times a week. Your doctor can help you choose a safe exercise plan.

### *Quit Smoking*

Smoking lowers your HDL level and raises your risk of heart attack, heart disease, and stroke. It also increases your risk of lung cancer. If you smoke and are older than age 35, you should not use birth control pills. The combination greatly increases the risk of heart attacks, particularly in women older than 35 years.

### *Medical Treatment*

If, after a few months, eating a healthy diet, exercising, and quitting smoking don't work, your doctor may prescribe medication to lower your cholesterol. While you are taking medication, you still should keep eating a low-fat and low-cholesterol diet.

### **Finally...**

Heart disease affects many women. You should be aware of the role that cholesterol plays in your health. Talk with your doctor about getting your cholesterol checked regularly. To keep your risk of cardiovascular disease as low as you can, exercise, stop smoking, and eat a low-fat and low-cholesterol diet.

### **Glossary**

***Atherosclerosis:*** Narrowing and clogging of the arteries by a buildup of plaque deposited in vessel walls; also called hardening of the arteries.

***Cardiovascular Disease:*** Disease of the heart and blood vessels.

***Cholesterol:*** A natural substance that serves as a building block for cells and hormones and helps to carry fat through the blood vessels for use or storage in other parts of the body.

***Estrogen:*** A female hormone produced in the ovaries.

***Hormone Therapy (HT):*** Treatment in which estrogen, and often progestin, is taken to help some of the symptoms caused by the low levels of these hormones.

***Lipoproteins:*** Substances that transport cholesterol to and from the liver throughout the blood.